Raymond Michael Miller

Environmental Research Division
Argonne National Laboratory
9700 South Cass Avenue
Argonne, Illinois 60439
Phone: (630) 252-3395
Fax: (630) 252-8895
Email: rmmiller@anl.gov

Web: http://pondside.uchicago.edu/ceb/faculty/Miller.html

Education

1969 B.S., Colorado State University, Botany
1971 M.S., Illinois State University, Biological Sciences
1975 Ph.D., Illinois State University, Botany and Mycology
1975-1977 Post Doctoral Fellow, Argonne National Laboratory (with R. Cameron)

Appointments

1997-present Senior Ecologist, Environmental Research Div., Argonne National Laboratory
2002-present Terrestrial Ecology Section Head, Environmental Research Division
1986-present Terrestrial Ecology Group Leader, Environmental Research Division
1980 - 1996 Terrestrial Ecologist, Argonne National Laboratory
1977 - 1980 Assistant Biologist, Argonne National Laboratory
1975 - 1977 Post doctoral Research Associate, Argonne National Laboratory
1986-present Lecturer, Committee on Evolutionary Biology, University of Chicago

Research Interests:

Plant and microbial influences on soil structure; carbon accrual mechanisms in soils; measures of ecosystem restoration; sustainable management of soil systems; effects of mycorrhizal fungi on community structure and function; ecophysiology of mycorrhizal plants; co-evolution of vascular plants and mycorrhizal fungi; anthropogenic influences on the mycorrhizal symbiosis; noninvasive methods for root research using hard x-ray micro- and macro-imaging procedures.

Professional Affiliations

Agronomy Society of America, American Institute of Biological Sciences, Ecological Society of America, International Soil Science Society, Mycological Society of America, Society for Ecological Restoration, Soil Ecology Society, and the Soil Science Society of America

Synergistic Activities

Review Panels (past 10 years):

Member, Strategic Environmental Research and Development Program, USDOD, Technical advisory committee for Ecosystem Management Projects, November

2003-2006.
Panel member, DOE Global Climate Research Graduate Fellowship Program, 2002
Panel member, Management Review of NIGEC Midwest Regional Center, 2002
Review panel member, Biosphere II, Future research directions, 2001
Member of OBER/DOE Cedar Creek BIOCON Review Panel, 2001
Member, Carbon Sequestration Panel, OBER/USDOE, 2000
Panel Member, DOE Global Climate Research Graduate Fellowship Program, 1999
Panel Member, USDA Soils and Soil Biology Panel, Competitive Grants Program, NRI, 1998
Panel Member, USDA Soils and Soil Biology Panel, Competitive Grants Program, NRI, 1997
Panel Member, NSF Special Competition for Global Climate Research, 1996
Panel Member, NSF Special Competition for Global Climate Research, 1995

Society offices and Committees (past 10 years):

Student awards committee chair, Soil Ecology Society Meeting, Palm Springs, May 2003.
Member, organizing committee, Soil Ecology Society meetings, Chicago, IL, May 23-26, 1999
Nominations Committee, Soil Ecology Society, 1997
Plenary Speakers Committee, 1st International Conference on Mycorrhizae, Univ. California, Berkeley, August 1996
Chairperson, Awards committee for the Soil Ecology Society, 1995

Other activities (past 10 years)

Visiting Lecturer, Department of Microbiology, Swedish Agricultural University, Uppsala, Sweden, August, 2000
Instructor for the 2nd International Conference on Mycorrhizae pre-conference workshop on Development and Function of the Mycelium of Arbuscular Mycorrhizal Fungi, July 1-4, 1998, Dept. Microbiology, SLU, Uppsala, Sweden.
Organized and conducted workshop on ?Methods used in Soil Ecology Research? Quito, Ecuador at the Fundacion Maquipucuna, May 1996 as part of The MacArthur Foundation Funded Project. (with D. Coleman and C. Rhodes, Univ Georgia)

Selected Publications (over 100)

1. Miller, R.M. and J.D. Jastrow. 1992. The application of va mycorrhizae to ecosystem restoration and reclamation. In: Mycorrhizal Functioning: An Integrative Plant-Fungus Process, M. Allen, ed. Chapman & Hall, Inc. pp. 438-467.

2. Miller, R.M. and J. D. Jastrow. 1992. The role of mycorrhizae in soil conservation. In: Mycorrhizae in Sustainable Agriculture, (Ed. by G. Bethlenfalvay and R. Linderman), Special Publ. 54 of the ASA, CSSA, and SSSA. pp. 29-44.

3. Miller, R.M., and J.D. Jastrow. 1994. VA mycorrhizae and biogeochemical cycling. In: Mycorrhizae and Plant Health, F.L. Pfleger and R.G. Linderman, eds. pp. 189-212. Am. Phytopath. Soc., St. Paul, MN.

4. Miller, R.M., D.R. Reinhardt and J.D. Jastrow. 1995. External hyphal production of vesicular-arbuscular mycorrhizal fungi in pasture and tallgrass prairie communities. Oecologia?103: 17-23.

5. Miller, R.M., and J.D. Lodge. 1997. The contributions of fungi to agriculture and forestry. In: The Mycota, Vol. IV., D. Wicklow and B. S?derstr?m (eds), Springer-Verlag, Berlin. pp. 65-84.

6. Jastrow, J.D., and R.M. Miller. 1998. Soil aggregate stabilization and carbon sequestration: Feedbacks through organomineral associations, In R. Lal, J.M. Kimble, R.F. Follett, and B.A. Stewart (eds.), pp. 207-223.

7. Jastrow, J.D., R.M. Miller, and J. Lussenhop. 1998. Contributions of interacting biological mechanisms to soil aggregate stabilization in restored prairie. Soil Biol. Biochem. 30: 905-916.

8. Jastrow, J.D., R.M. Miller and C.E. Owensby. 2000. Long-term effects of elevated atmospheric CO2 on belowground-biomass and transformations to organic matter in grassland. Plant and Soil 224: 85-97.

9. Miller, R.M. and J.D. Jastrow. 2000. Mycorrhizal fungi influence soil structure. In: Arbuscular Mycorrhizas: physiology and function, Y. Kapulnik and D. Douds, eds. Kluwer Academic Publishers, Dordrecht, p 4-18.

10. Miller, R.M. and M. Kling. 2000. The importance of integration and scale in the arbuscular mycorrhizal symbiosis. Plant Soil 226: 295-309.

11. Schultz, P., R.M. Miller, C. Rivetta, J.D. Jastrow, and J. Bever. 2001. Evidence of a mycorrhizal mechanism for the adaptation of Andropogon gerardii to high and low-nutrient prairies. American J. Botany 88: 1650-1656.

12. Miller R.M., S. Miller, J.D. Jastrow and C.B. Rivetta. 2002. Mycorrhizal mediated feedbacks influence net carbon gain and nutrient uptake in Andropogon gerardii Vitman. New Phytologist 155: 149-162.

13. Zhu Y.G., and R.M. Miller. 2003. Carbon cycling by arbuscular mycorrhizal fungi in soil-plant systems. Trends in Plant Science 8: 407-409.

14. Miller, M. 2004. Commentary on role of genetically modified soil organisms in soil carbon sequestration. p. 90-93 In N.J. Rosenberg, F.B. Metting and R.C. Izaurralde (eds.) Applications of biotechnology to mitigation of greenhouse warming. Proceedings of St. Michaels II Workshop, 13-15 April 2003, St. Michaels, MD. Battelle Press, Columbus, OH. 213 pp.

15. Allison, V.J., and R.M. Miller. 2004. Using fatty acids to quantify arbuscular mycorrhizal fungi. In:Mycorrhizae: Basic Research and Applications:Mycorrhizae, edited by G. Podila and A Varma. Springer Publ. (in press).
16. Allison V.J., Miller R.M. 2004. Using fatty acids to quantify arbuscular mycorrhizal fungi. In: Basic Research and Applications of Mycorrhizae, G. Podila and A. Varma. Eds. I.K. International Pvt. Ltd. New Delhi, pp 141-161.
17. Allison V.J., Miller R.M. 2005. Soil Grinding increases the relative abundance of eukaryotic phospholipid fatty acids. Soil Science Society America Journal 69: 423-426.
18. Miller R.M. 2005. The nonmycorrhizal root - a strategy for survival in nutrient-impoverished soils. New Phytologist 165: 655-658.